



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,916	07/31/2003	Jian Qin	19109 (27839-1199)	9626
45736 7590 02/09/2009 Christopher M. Goff (27839) ARMSTRONG TEASDALE LLP ONE METROPOLITAN SQUARE SUITE 2600 ST. LOUIS, MO 63102				
EXAMINER CHAPMAN, GINGER T				
ART UNIT		PAPER NUMBER		
3761				
NOTIFICATION DATE		DELIVERY MODE		
02/09/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USpatents@armstrongteasdale.com

Office Action Summary

Application No.

10/631,916

Applicant(s)

QIN ET AL.

Examiner

Ginger T. Chapman

Art Unit

3761

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-18, 20, 21, 23-25 and 40 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 13-18, 20, 21, 23-25 and 40 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 31 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/29/2008 has been entered.

Status of the claims

2. Claims 19 and 22 are canceled; claim 13 is amended; claims 13-18, 20-21, 23-25 and 40 are pending in the application.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

After careful review of the specification, examiner has determined that claim 1 which recites about 0.5% by weight of a cationic polymeric coating is not taught by the Specification as originally filed. In particular, the coating claimed disclosed in Table 2, p. 19 and paragraph [0046], pp. 14-15 with respect to a surface treatment does not provide support for 0.5% by weight of a cationic polymeric coating.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. Claims 13-18, 20-21, 23-25 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beihoffer et al (US 6,509,512 B1) in view of Tanaka et al (US 5,274,018).

With respect to claim 13, as seen in Figures 1 and 2, Beihoffer et al disclose a surface treated absorbent material (10, 20) comprising a superabsorbent material (c. 5, ll. 9-10) consisting essentially of a superabsorbent polymer consisting essentially of

(a) at least about 75 weight percent anionic polymer (c. 6, ll. 51-52; c. 6, ll. 40-42; c. 9, ll. 31-37), comprising functional groups which are carboxyl groups (c. 2, l. 27-29; c. 9, ll. 18-20; c. 5, ll. 16-17; c. 11, ll. 5-6); and

(b) an internal crosslinking agents based on the polymerizable unsaturated acid group containing monomer (c. 8, ll. 8-9; c. 7, ll. 56-60), wherein the superabsorbent polymer has a degree of neutralization (c. 7, l. 47; c. 9, l. 17); wherein elements (a) and (b) are polymerized and prepared into superabsorbent polymer particles (c. 12, ll. 5-8, ll. 35-39; c. 7, ll. 31-33; c. 4, ll. 62-64) and further comprising surface additives to form surface treated superabsorbent polymer particles

(i) from about 0.1% to about 7%, by weight of surface crosslinking agent based on the superabsorbent polymer composition (c. 8, ll. 16-19; c. 13, ll. 19-21; c. 14, ll. 24-48); and

(ii) a cationic polymeric coating based on the superabsorbent polymer composition.

Beihoffer discloses the claimed invention except for teaching the claimed crosslinking amounts. Beihoffer teaches the crosslinking agents from about 0.1 weight % to about 7 weight % based on the total weight of the monomers with respect to the anionic polymer (c. 8, ll. 16-18) and about 0.01% to about 4% by weight of surface crosslinking agent in solution with respect to the surface treated polymer particles and from about 0% to about 1% by weight of the particles

(c. 13, ll. 10-20), thus providing motivation for crosslinkers and disclosing the general conditions of the claim of applying ranges of crosslinkers.

Beihoffer teaches, at c. 8, ll. 7-9, that the crosslinker is applied to a sufficient extent to render the polymer water insoluble and determine the absorptive capacity of the polymers; at c. 12, l. 65 to c. 13, l. 2. Beihoffer teaches that it is known in the art that the surface crosslinking enhances the ability of the superabsorbent polymer particles to absorb and retain fluids. One of ordinary skill in the art at the time the invention was made would recognize that crosslinking agents promote differences in the polymers' physical properties by modifying the degree of bonding between the polymer chains, and that modifying the amounts used would modify the degrees of swelling, polymer expansion and fluid absorption of the polymers.

Therefore it would have been within the ordinary skill of a worker in the art to determine the optimum or workable ranges of amounts of crosslinkers to obtain the desired degree of swelling and absorption for a particular end use. Therefore it would have been obvious to one of ordinary skill in the art to modify the ranges of amounts of crosslinker in the material of Beihoffer order to obtain the desired degree of these properties since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Beihoffer discloses the claimed invention except for expressly disclosing the degree of neutralization is greater than about 25%. Beihoffer teaches the most commonly used super absorbent polymer is neutralized polyacrylic acid containing at least 50% up to 100% neutralized carboxyl groups (c. 2, ll. 27-30). Beihoffer teaches that decreasing or increasing the degree of neutralization increases or decreases the polyelectrolytic properties that provide the swelling and

superabsorbent capability of the polymer to absorb fluid (c. 15, ll. 4-6 and ll. 11-13; c. 1, ll. 45-47), thus the degree of swelling and absorption is a result effective variable of the degree of neutralization. At c. 5, ll. 14-17, that Beihoffer provides the polymer having, *inter alia*, 0% to 200% neutralized carboxylic acid groups (c. 9, ll. 16-20), and provided in a matrix which can be a polyacrylic acid neutralized greater than 25 mole % and typically greater than 50 mole %. Thus Beihoffer provides motivation for providing the polymer with a degree of neutralization to modify the parameters of swelling and absorption.

Careful review of the instant Specification, in particular at, ¶¶ [0029, 31], reveals that the only disclosure of neutralization or the instant claimed degree of neutralization is:

[0029] In one particular embodiment, the superabsorbent material comprises a cross-linked polymer comprising at least about 75 weight percent anionic polymer. The term polymer as used herein is intended to refer to either a single polymer or to a mixture of polymers. The term "anionic polymer" is intended to refer to a polymer or mixture of polymers comprising a functional group or groups having a potential for becoming negatively charged ions upon ionization in an aqueous solution. More suitably, the superabsorbent material comprises a cross-linked polymer comprising at least about 85 weight percent anionic polymer, and even more suitably at least about 90 weight percent anionic polymer. In general, suitable functional groups for an anionic polymer include, but are not limited to, carboxyl groups, sulfonate groups, sulphate groups, sulfite groups, and phosphate groups. Suitably, the functional groups are carboxyl groups. **It is preferred that these functional groups are in neutralized form. A suitable degree of neutralization is at least 50%, more suitably at least 60%, and even more suitably at least 70%.**

[0031] In another embodiment, the superabsorbent material comprises a cross-linked polymer comprising at least about 75 weight percent cationic polymer. A cationic polymer as used herein refers to a polymer or mixture of polymers comprising a functional group or groups having a potential of becoming positively charged ions upon ionization in an aqueous solution. More suitably, the superabsorbent material comprises a cross-linked polymer comprising at least about 85 weight percent cationic polymer, and even more suitably at least about 90 weight percent cationic polymer. In general, suitable functional groups for a cationic polymer include, but are not limited to, primary, secondary, or tertiary amino groups, imino groups, imido groups, amido groups, and quaternary

ammonium groups. It is preferred that these functional groups are in neutralized form. A suitable degree of neutralization is at least 50%, more suitably at least 60%, and even more suitably at least 70%.

Therefore, absent evidence to the contrary, it appears that the teaching of Beihoffer of providing the polymer having, *inter alia*, 0% to 200% neutralized carboxylic acid groups (c. 9, ll. 16-20) meets the claim as supported by the instant Specification.

Beihoffer discloses the claimed invention except expressly disclosing for the weight amounts of the cationic polymer coating. Beihoffer teaches cationic polymer coatings, thus providing motivation for such. Tanaka teaches the ability of a cationic coating to improve the absorption properties of an anionic polymer to improve or increase the polyelectrolytic properties that provide increased swelling and absorption of the polymer in the presence of physiological fluids such as urine and blood (c. 3, ll. 45-48; c. 1, ll. 15-20; c. 2, ll. 4-5). Tanaka teaches a cationic coating in an amount of from about 0.5% to about 5% by weight of the anionic polymer (c. 2, ll. 4-7). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the coating of Beihoffer in the range taught by Tanaka since Tanaka states, at c. 5, ll. 10-14, that the benefit of such a modification is that this provides a polymer that exhibits the same superabsorbency in the presence of human urine as its superabsorbency in the presence of water thereby providing a superabsorbent useful in diapers to provide larger absorbent capacities (c. 1, ll. 40-41).

Beihoffer discloses the claimed invention except for a gel stiffness index of at least 0.8 as tested by test methods set forth by Applicant, Beihoffer discloses the absorbent material is of the substantially the same type and formed in the same manner as the instant invention. Crosslinking agents are known in the art to promote or regulate intermolecular covalent bonding

between polymer chains, linking them together to create a more rigid structure. One of ordinary skill in the art would recognize that greater amounts of crosslinking would increase the rigidity of material while lesser amounts would decrease the rigidity obtained, thus making the gel stiffness index of the material a result effective variable. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to obtain the claimed stiffness index for a particular end use since discovering the optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to claims 14-17, 20, 24-25 and 40, Beihoffer discloses the claimed invention except for the results of tests performed by Applicant. Beihoffer performs similar tests, but does not perform the claimed tests so does not disclose results for the claimed tests or specific values of these tests, but rather only for their tests.

No structure is disclosed in these claims; the material is claimed in terms of its desired properties, i.e. what it does rather than what it is. All materials claimed are disclosed in the instant Specification, in particular the anionic polymer, the crosslinkers and the cationic coatings, as being products which are commercially available and sold according to their known functions and are utilized in the instant claimed invention according to their known functions with no change in their respective functions of these known products. The degrees of the properties claimed are known in the art to be modified by the degrees or ratios of amounts of the products which are combined.

In other words, the combination of these known products in the instant claims unites known products in conventional manner according to their respective functions and ratios, and

yields the expected results of polyelectrolytic swelling, polymeric expansion and absorbency which are modified in degrees corresponding the degrees or ratios of the products combined.

The specification contains no criticality for the specific nature of the claim limitations, the ranges claimed, or any unexpected results arising therefrom, the limitations appear to be expected, the values arbitrary and therefore obvious. Such unsupported limitations cannot be the basis for patentability, since where patentability is said to be based upon particular dimensions or another variable in the claim, the applicant must show that the chosen variables are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ 2d 1934 (Fed. Cir. 1990). One having ordinary skill in the art would be able to determine the ideal amounts of crosslinking agents and coatings for particular superabsorbent polymers for a particular end use.

With respect to claim 18, Beihoffer discloses the cationic polymer is polyvinyl amine (c. 14, l. 45; c. 5, l. 19; c. 9, l. 50; c. 11, l. 51).

With respect to claim 21, Beihoffer discloses the surface treatment is applied to substantially the entire outer surface of the superabsorbent material (c. 13, ll. 5-6, ll. 14-15; Example 9, c. 18, ll. 4-7).

With respect to claim 23, Beihoffer discloses the surface treatment further comprises in the range of about 0.5 to about 5 grams per weight of water per 1 gram weight of superabsorbent material (Example 11, c. 18, ll. 35-45).

Claims 13-25 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nambu et al (US 5,883,158).

With respect to claims 13-25 and 40, Nambu et al disclose the invention substantially as claimed except for the surface treatment comprises in the range of about 0.5 to about 5 grams

weight of water per 1 gram weight of superabsorbent material. Nambu et al teach at c. 5, ll. 24-30 that the amount of water is a parameter that effects whether the cross-linked structure is formed on the outer surface of the particle or is formed on the inside surface of the particle. Therefore the amount of water is a result effective variable in the known process of forming the structure of the absorbent material and it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the amount of water known in the prior art to form the treatment at the desired surface since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering optimum or workable ranges of a result effective variable involves only routine skill in the art. *In re Boesch and Slaney*, 205 USPQ 215 (CCPA 1980).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginger T. Chapman whose telephone number is (571)272-4934. The examiner can normally be reached on Monday through Friday 9:30 a.m. to 6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tatyana Zalukaeva can be reached on (571) 272-1115. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ginger T Chapman/
Examiner, Art Unit 3761
01/15/09

/Tatyana Zalukaeva/
Supervisory Patent Examiner, Art Unit 3761